

REMARKS

Please cancel Claims 7, 13 and 24 without prejudice. Claims 1, 8, 10, 12, 21-23 and 25 are pending. Claims 1, 8, 10, 21 and 25 are amended herein. No new matter is added as a result of the claim amendments – the subject matter of canceled Claims 7, 13 and 24 is incorporated into their respective base claims.

102 Rejections

Claims 1, 8, 10, 12, 21-23 and 25 versus Zheng et al.

The instant Office Action states that Claims 1, 8, 10, 12, 21-23 and 25 are rejected under 35 U.S.C. § 102(e) as being anticipated by Zheng et al. (U.S. Patent No. 6,693,321; hereinafter “Zheng”). The Applicants have reviewed the cited reference and respectfully submit that the present invention as recited in Claims 1, 8, 10, 12, 21-23 and 25 is not anticipated by Zheng.

Applicants note that the instant application and Zheng were, at the time the present claimed invention was made, owned by, or subject to an obligation of assignment to, the same assignee.

Applicants respectfully submit that Zheng does not show or suggest the particular memory cell structures recited in independent Claims 1, 10 and 21. Zheng states “the gate dielectric 20 could be a multi-layer dielectric” (column 7, lines 7-8). However, even as a multi-layer dielectric, Zheng does not teach that the gate dielectric 20 includes different materials – that is, Zheng does not teach that the gate dielectric 20 includes a layer of one type of material

and another layer of a different type of material. Zheng specifically states “[t]he gate dielectric 20 may be made of suitable gate dielectric materials including SiO₂ or of dielectric materials having a dielectric constant greater than SiO₂” (column 7, lines 8-10). By using “or” rather than “and,” Zheng is unambiguous with respect to the use of one material or another, and only one material, in gate dielectric 20. Furthermore, while Zheng states “the gate dielectric 20 could be a multi-layer dielectric” (column 7, lines 7-8), Zheng does not state how many layers are in the multi-layer gate dielectric 20. Also, even if, for the sake of argument, it is presumed that Zheng’s multi-layer gate dielectric 20 includes layers of different materials, Zheng does not describe how those layers are arranged.

In summary, Applicants respectfully submit that Zheng does not disclose multiple layers of different materials between a substrate and a floating gate, how such layers are arranged, nor the number of such layers. According to the Federal Circuit, “[a]nticipation requires the disclosure in a single prior art reference of each claim under consideration” (W.L. Gore & Assocs. v. Garlock Inc., 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983)). However, it is not sufficient that the reference recite all the claimed elements. As stated by the Federal Circuit, the prior art reference must disclose each element of the claimed invention “arranged as in the claim” (emphasis added; Lindermann Maschinenfabrik GmbH v. American Hoist & Derrick Co., 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984)).

Therefore, Applicants respectfully submit that Zheng does not anticipate the limitations of independent Claims 1, 10 and 21, and that the

rejection of these claims under 35 U.S.C. § 102(e) is traversed. Applicants also submit that the rejection of Claims 8, 12, 22-23 and 25 under 35 U.S.C. § 102(e) is traversed, as Claims 8, 12, 22-23 and 25 are dependent on Claim 1, 10 or 21 and recite additional limitations.

Claims 1, 8, 10, 12, 21-23 and 25 versus Huang et al.

The instant Office Action states that Claims 1, 8, 10, 12, 21-23 and 25 are rejected under 35 U.S.C. § 102(e) as being anticipated by Huang et al. (U.S. Patent No. 6,872,972; hereinafter “Huang”). The Applicants have reviewed the cited reference and respectfully submit that the present invention as recited in Claims 1, 8, 10, 12, 21-23 and 25 is not anticipated by Huang.

Applicants respectfully submit that Huang does not show or suggest the particular memory cell structures recited in independent Claims 1, 10 and 21. Huang discloses an ONO tunnel oxide layer 420 between the substrate 404 and the floating gate 406 (column 4, lines 60-64). At line 10 in column 2, Huang teaches that the ONO layer consists of SiO₂/Silicon Nitride/SiO₂.

In contrast to Huang, independent Claim 1 recites two adjoining layers that include SiO₂ and metal oxide, respectively, where the metal oxide is not SiO₂ (because, as claimed, the metal oxide has a dielectric constant greater than that of SiO₂). Also in contrast to Huang, independent Claim 10 recites two adjoining layers that include a silicon material and metal oxide, respectively, where the metal oxide is not SiO₂ (because, as claimed, the

metal oxide has a dielectric constant greater than that of SiO₂). Furthermore, in contrast to Huang, independent Claim 21 recites three adjoining layers that include a first silicon material, metal oxide, and a second silicon material, respectively, where the metal oxide is not SiO₂ (because, as claimed, the metal oxide has a dielectric constant greater than that of SiO₂).

According to the Federal Circuit, “[a]nticipation requires the disclosure in a single prior art reference of each claim under consideration” (W.L. Gore & Assocs. v. Garlock Inc., 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983)). However, it is not sufficient that the reference recite all the claimed elements. As stated by the Federal Circuit, the prior art reference must disclose each element of the claimed invention “arranged as in the claim” (emphasis added; Lindermann Maschinenfabrik GmbH v. American Hoist & Derrick Co., 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984)).

In summary, Applicants respectfully submit that Huang does not disclose multiple layers of different materials arranged as in the claims between a substrate and a floating gate. Therefore, Applicants respectfully submit that Huang does not anticipate the limitations of independent Claims 1, 10 and 21, and that the rejection of these claims under 35 U.S.C. § 102(e) is traversed. Applicants also submit that the rejection of Claims 8, 12, 22-23 and 25 under 35 U.S.C. § 102(e) is traversed, as Claims 8, 12, 22-23 and 25 are dependent on Claim 1, 10 or 21 and recite additional limitations.

Conclusions

In light of the above remarks, Applicants respectfully request reconsideration of the rejected claims.

Based on the arguments presented above, Applicants respectfully assert that Claims 1, 8, 10, 12, 21-23 and 25 overcome the rejections of record and, therefore, Applicants respectfully solicit allowance of these claims.

The Examiner is invited to contact Applicants' undersigned representative if the Examiner believes such action would expedite resolution of the present Application.

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Respectfully submitted,
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